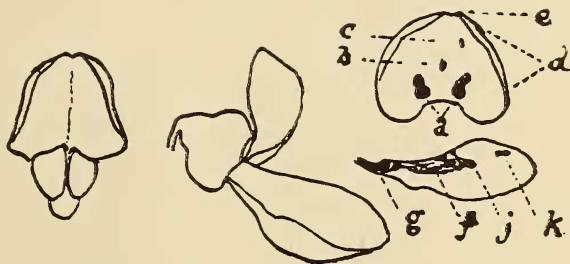


## A Note upon the Way in which Bees settle on Flowers of *Derris thyrsiflora*, and the Injury resulting from their Search for Honey.

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In the Botanic Gardens, Singapore, there is a large plant of *Derris thyrsiflora*, Benth., climbing over a tree of *Cyrtophyllum fragrans*, DC., near to the Director's house. Its stem has a circumference at the base of eighty centimetres; and it ascends to nearly 20 metres. When in flower it is very conspicuous, and attracts enormous numbers of bees, whose hum on the flowers is heard all day. Among the bees are *Apis dorsata*, L., *Apis indica*, F., *Xylocopa latipes*, F. rarely, *X. aestuans*, L., *Anthophora zonata*, L., and *Melipona* sp. Occasionally a butterfly visits also.

Owing to the height at which the flowers stand, it has been extremely difficult to take the insects; and the list is consequently imperfect.



The flower of *Derris thyrsiflora* in face and in side view  
 × 2: the standard and right ala showing the places most  
 injured by the bees.

The flowers are white with an undefined line of green down the centre of the standard. Their form is seen in the figures above.

In all their parts oxidation develops a black pigment: and by means of this it has been interesting to observe the injury which visitors do to the flowers; for injury results in oxidation.

The mechanism of the flower is typically papilionaceous. There is abundant honey within the staminal tube: the approach to it is by a wide opening upon either side of the free upper filament allowing easy access to those insects which can force apart the standard and the interlocked wings and keel sufficiently. The one

effect of the forcing of these apart is injury to the claws of the petals which serve as springs, so that after visits they are suffused with the black pigment in consequence of rupture of the epidermal layer. The other effect is due to the feet and head of the visitors which they use in their effort to prise the flower open. Invariably as a consequence of this two dark spots develop at the base of the standard one on either side near the brow over the way to the honey. It is to be noted that this injury is invariable. And often these two areas can be seen to be made up of three or four confluent injuries, each resulting in a complete perforation of the limb. Corresponding with them may be seen perforations of the wings, which are less commonly confluent from being more dispersed. But of the wings still there is invariably damage about f., and also especially at the corner j. These places are close to the folds whereby the wings and keel are interlocked, but beyond them. Presumably they are at the points where the visitors get the best purchase.

In other parts of the standard and the wings there is but inconstant and slight damage done: and the keel which has the function of protecting the pollen rarely is marked except in its claws and sometimes at the very tip.

In about 5% of the falling flowers injury to the standard had occurred near b., and in less than 5% at c. In a greater percentage some injury occurred right at the tip. The wings are rarely damaged at k.

The evidence is very clear that every flower gets repeatedly visited. But only a small percentage set seed as over 90% fall entire. The remainder however are sufficient to supply what may be regarded as quite an abundant seed-crop.